

Home Computing WEEKLY

August 2-8, 1983 No. 22

Argus Special Publication

38p

INSIDE

Programming tips for VIC-20, TI-99/4A, Oric, Spectrum and Tandy Colour

Great games to type in for: VIC-20, Dragon and ZX81/Spectrum

Software reviews for: Dragon, Spectrum, Atari, TI-99/4A, VIC-20, Dragon, BBC and ZX81

PLUS: News, Charts and One Man's View

First Microdrives to users 'in days'

SPECTRUM owners will be using Microdrives, Seacat's new mass storage device, within days. It has, in common, claims from managing director Nigel Scarle at the launch on Thursday, when he said details had been mailed to 100,000 Spectrum users on the company's mailing list.

He said however that just 1,000 were ready for dispatch — arriving within 28 days of the order — but there will be more as the following weeks as production was ramped up.

Mr Scarle said: "Our object is to be supplying 20,000 peripherals per month as soon as we can ramp up in a few months."

Seacat Research launched three products:

- The FX Microdrive, costing £49.95, and offering the mass equivalent of 5.14-inch disc drive capability.

- The ZX Interface 1, costing £29.95, of height with a Microdrive. This price if purchased separately is £69.95.

- Two cartridges for the Microdrive, one £4.95 each and contain about 200,000 of tape about 11.14 of an inch wide.

Mr Scarle said: "The one will have the speed, capability and operating system aspects automated with a disc drive. It is extremely simple for the first-time user."

Seacat's chairman, Sir Clive Seacat, was asked who it had



More pictures inside

A Microdrive connected, showing how the cartridge is inserted

taken so long to bring out the Microdrive.

He said: "That's a very good question — it's bloody hard to do. We are making an equivalent to the disc drive."

"We did not anticipate the use of the floppy support that would be needed. When we first discussed it so, the Spectrum had not been born, had."

"Instead of the thousands it will be hundreds of thousands — an unbelievable number of cartridges."

Mr Scarle said that the first mail order customers would be delivered to two Microdrives each, but there would be no limit on cartridges.

Seacat was supplying Microdrives to software houses, which could bring out programs

on cartridge. He added: "It will take a few months for software, on Microdrives to overtake their disc versions. As prices for the peripherals were being produced at one-third (EMI Discs's price). And Trans-Quantum, a high mass Spectrum, is being considered as a second mainline, later. Mr Scarle would not say where the cartridges are being made, only that the factory was in the Midlands.

He said they did not know how many cartridges each Microdrive user would want, it could be 100, it could be one. He said: "We have planned capability to build at least half a million cartridges per week." And he predicted that there will be a second issue from the autumn, called Interface 2. (Continued on page 2)

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THE WALKER'S TOMB

25 95
Front-left Tomb is an adventure for one player. One year, on One One night, under the middle of the night, at mid night, the way to its entrance is an empty, silent, before you, Walker's Tomb comes complete with a 20 page fully illustrated new life.

ESSENT

25 95
Situated on the border between Elven and Naga, the highest mountain in the world. Elven, Goddess Mother of the world, towers (one and a half miles above sea level) in 1993. The Elven Mother and Goddess (one and a half miles above sea level) in 1993. The Elven Mother and Goddess (one and a half miles above sea level) in 1993. The Elven Mother and Goddess (one and a half miles above sea level) in 1993.

CARIBBEAN POWER

25 95
By the year 1700 the world is a barren and desolate wasteland. With all natural resources used up, the human race is fast dying out with a hope of being able power, which leads to a C.R.O.D. Now the C.R.O.D. has been invaded by a race of evil druids from England. You are on the moral upswing, race of druids to control those druids, an incredibly powerful and unbreakable step, the Caribbean, was developed. Visual artists stop the druids and save the Earth! Caribbean is an arcade game requiring 1 player.

DRAGON 10 and TANDY 10K (please specify)

Dragon 10K, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 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Oric get the Hobbit habit

Since Oric, we hope, will be able to play *The Hobbit*, the best selling software game originally produced by Melbourne House for the Spectrum.

Melbourne House has now contacted the game for the Oric and it will be released for Oricware at the end of September.

All the features of the Spectrum version will be there, including the first paperback of Tolkien's novel and the price of £14.95.

Paul Kaufman, Toronto's managing director said: "We're particularly pleased about it because it shows that companies like Melbourne House are taking the Oric seriously."

The Oric Hobbit will be available through retail outlets or direct by post from Toronto: Paragon, 1 Clark West, 4th Floor, O87 4748.

Three in one tape for the TI

Software brings TI owners — Paragon has brought out a game tape for the TI which of less than a year ago was for £1.95.

It's called *Games Tape One*, and the three games on it are *Traps*, *Sea-Storm* and *Assault*.

Paragon has also gone in for selling itself to the public by marketing the tape in America, the TI-99/4A's native land. Apparently the Americans are taking it well.
Paragon, 48 Gower Street, London WC1N 3JH.

Top into morse

Now your VIC-20 can make you the Morse Code Morse Tutor, from A-B-C Software, is used to take you from beginner to expert at your own rate and includes two tapes of test with score ratings. It costs £8, expansion and costs £10 for mail.

A-B-C Software, 29 Church Street, Southampton, Hants SO9 6BP.

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If you're got the new Aquarius memo, Argus press have got some software for it: *Aquas Pairs 1* and *2*, an arcade game and an educational pack respectively.

Coming up soon are four more games: *Aquasaurus*, an underwater version of *Snake*; *Aquasoft*, a *Snake* variant; *Crashdown*, a *Motor Manna*-type game; and *Aquascan* (no price).
All these are for the compacted Aquarius and cost £9.95.

Apocalypse (no price) is the expanded Aquarius order. It will be bringing you a *Snake* variant — called, naturally, *Aquasoft* — and some abstract games for a *Apocalypse* software, *J. F. Scott* (no price), *Atkinson*, *Orford*.

Free read

Starbuck, a Liverpool-based software house, has brought out the first of a series of free brochures on software and peripherals for possible comparison.

The first issue, for the VIC-20 and Commodore 64, will be followed by brochures for Spectrum and ZX81, Dragon and BBC micro. Starbuck own shop will contain its own products as well as the best of other makers' software and peripherals. An L44 is added.

Starbuck, 208 Highgate Road, Archway, London N6 7RP.

John's first for the 64

John Shaw, 16-year-old part-time boxer, is bringing out the first of a series of games for the Commodore 64.

Calculus, a review of his VIC-20 program is on machine code and due to take a three weeks. It will be followed by about 10 more.

John is a family affair. John's mother, Brenda, is the other parent and father John, a printer, looks after the partnership's printing needs.

Shaw, 16-year-old, 37 Winchester, Reading, Hants. (0494 5025 607)

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Continued from front page

which will allow the Spectrum to support software on ROM cartridges and peripherals.

In a demonstration, the popular High Simulation program was loaded onto a Spectrum via a Microdrive in just under 9 seconds — a world-record calculation to seven minutes. Access time is claimed 3.5 seconds.

The ZX interface, as well as controlling Microdrive, offers the industry-standard RS 232C

terminal as available to all customers separately at £5.

Each cartridge can contain up to 30 files which can be individually identified, sorted automatically, and displayed in alphabetical order or sorted.

The Microdrive controller, inside the interface, expands Seagate's RAMAC up to include file handling and communications facilities and standard BASICS text operating system as well as language, and Sinclair Research. It makes the Spectrum an ex-



Three Microdrives connected together and attached to a Spectrum

ZX interface. It attaches to the underside of the Spectrum and duplicates the computer's peripheral port.

The RS232C industry standard serial interface enables the Spectrum to drive full-line printers and so communicate with other computers having the serial interface. It also permits transmission of data over telephone lines via modems.

Interface 1 operates on all standard board sets up to 19,200-word speed, software selectable, and a special RS232C board is separately available from Sinclair Research at £24.99.

The local area network is a high speed communications link, but even up to 64 Spectrums, transmitting at 100 kilobaud. A full screen can be transferred in 3 seconds and protocols allow transmitting and receiving data to be specified by user.

Another, or the data may be broadcast over the network in any open Spectrum.

Sinclair Spectrums can act as printer servers to other Spectrums, or the network driving under a ZX Printer by any other printer using the RS232C interface. They may also be dedicated as file servers, exchanging files from their Microdrives with other Spectrums in the network.

The ZX Network, opens up a wide range of possibilities not the user from advanced multi-player games of fun and skill to operate use in the classroom and office.

Computers, who bought Spectrums from shops and wish to be added to the existing list, should send their name and address only, on a postcard to Sinclair Research Department, 90, Finsbury, Cambridge, Surrey GU1 3JH.



Here the ZX interface 1 links the Spectrum to two Microdrives and an Epson printer

surface — which means other computers and printers can be linked — as well as the chance to network up to 64 Spectrums, which can use more than 100 users at once.

It was shown linking Spectrums to an IBM Personal Computer and an Epson printer.

Mr. Smith said the age-life of the cartridge was in excess of 3,000 read-write operations. The computer did advise, however, that users keep backup copies of software.

Sinclair's new interface 1 can support up to eight Microdrives giving a total storage of 800K. Each Microdrive stores a maximum of 80K and every drive will include a file cartridge with demonstration program.

The Microdrive/Interface 1

remains a powerful tool, says Sinclair periodically for education and business applications like stock control and personal, financial modelling and accounting.

- Loading a typical 40K program in as little as 3.5 seconds.
- Full use of BASIC, LOGO and MATHS commands.
- Full RS232C to transfer the cartridge.

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- Powered by Spectrum's power supply.
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The interface 1, which attaches to the Spectrum at the rear edge connector, fits into the top drive, fitting the computer forward to 20-degrees

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Software hideaway just for two

Hidden away on the top floor of an old brick house in a quiet Hampstead village, a two-man team is working on new computer games.

And to keep their heads on their work they have agreed that they cannot be reached by phone or both any other.

The two are Quick'n's, a technical director John Hollis and the company's 30-year-old chairman Nick Lambert.

Mr Lambert has long wanted to concentrate on software and the recent restructuring of the company freed him of day-to-day administration.

Another director, Mark Eyles, said: "They had to move right away from our offices in Southampton because it's too hectic here. They wouldn't be able to get anything done."

Lambert does seem. Quick'n's is exporting some top quality games from the two with some frequency since its move.

Meanwhile, the company has just released two Spectrum adventures, a BBC graphics tape, a strategy game and two adult games.



John Hollis

■ **Dark Art**, contact 04 85, uses a joystick or control keys to draw lines and shapes. Wholes by Dave Mendes for the BBC model is easy, it can use all 16 colours on mode 1.

■ **Freely Nighth**, a sort of computer pinball machine, was 3D Strategy, for both models of the Spectrum. Based on 3D thoughts and errors, he claims it is five times as fast as similar programs and thereby can be 100 per cent machine code.

■ **Night's Lair** is a Dungeons and Dragons-type adventure in which the player can choose to be a wizard, warrior or priest to search for an evil wizard. It was written by Derek Heywood at Neptune Computing, for the BBC Spectrum.



Dave Mendes

■ **The strong adventure** profiled **Knights**. Come and explore searching for treasure in a cave system. It runs on the BBC Spectrum and the author was John Kennedy.

■ **John Hollis** — who wrote the best seller **Time Gate** — produced **Aquaplane** in which he and then have to be guided around obstacles. The background and the whole screen and the game features characters like the GATs, such youngsters as profits, the Rapists, a group of wicked sailors, and the Great White Shark. **Aquaplane** runs on the BBC Spectrum.

■ **Nathan** is a 3D arcade adventure with all kind of landscapes and dangers to avoid, including Yomps, Nam Shals, Cybers and Astronauts. It needs a BBC Spectrum.

All the Spectrum tapes cost £5.95.

Quick'n's, which has just formed a US company, has signed a deal to market Jeff Minter's Spectrum program. Mr Minter, of Lismacall, has formed Salamander to produce Spectrum and Dragon versions of his VIC 20 games.

Spectrum versions include **Goldmine**, **Marmite**, **Attack of the Madmen**, **Comet** and **Trees**.

Quick'n's says its new distribution and manufacturing deal with recent print CDD will make "even more reliable" tapes.

Quick'n's, **Palmerton Park House 21 Palmerton Road, Southampton SO9 1LL**.



Freddy Nighth

Computing in the city

London is definitely the place to be for computer training this summer — particularly if you're under 16.

Throughout August, Youth Outreach Service is running courses in which both money and experienced computer users can get their hands on a mouse and improve their skills.

The programme also includes discussions, visits to places where computers are used and video films about computers in business and industry.

The courses will be based in the YOS centre in Loughborough, and run £20 for a week, including lunch.

Inter-Action Trust and Aray have got together to organise all our week-long courses which will take place throughout August in several different London locations.

During the course, participants will get expert advice on the Atari 800, disks, web editors and how computers can further their educational and employment prospects.

The best cheap for a week is

£40, but there are discounts for children of Chelsea residents or the unemployed.

YOS Computer Centre, 2108 Chiswick, Burnley Road, Loughborough L11 3JH. Tel: 0181 275 1000.

TI owners — play the political game

Does the idea of the imaginary 88 you wish please? Then you could be very powerful. A group of concerned TI owners in Hull has produced a program which lets you have a try.

Taking the view of government, you can control income tax, company tax, and VAT and public spending. The TI will let you see the effect on inflation, unemployment, and — most importantly — how you're doing in the opinion polls. Preserving the Queen's favour.

The programme's highlights is given in a page 15. C. Cooke, 41 North Lane, Thorngumbold, Hull HU12 8PZ.

You could be on our pages

We welcome program articles and tips from our readers.

PROGRAMS should, if possible, be computer printed to a width of 48 characters (up to a new ribbon and/or sent on cassette. Check carefully that they are bug-free, include details of what your program does, how it works, variables you have used and hints on conversion.

ARTICLES on using home computers should be no longer than 2,000 words. Don't worry about your writing ability — just try to keep to the style in HCL. Articles most likely to be published will help our readers make better use of their micros by giving useful ideas, possibly with programming examples, we will convert any sketched illustrations into finished artwork.

TIPS are short articles, and brief programming routines which we can put together with others. Your hints can also other computer users.

Competitive rates are paid.

Keep a copy of your submissions and include an SAE if you want them returned. Label everything clearly and give a daytime and home phone number if you can.

Paul Upton, Home Computing Weekly, 145 Charing Cross Road, London WC2N 3BS

VIC-20 PROGRAM

```

5000 B0000000
5010 B0000000
5020 B0000000
5030 B0000000
5040 B0000000
5050 B0000000
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5070 B0000000
5080 B0000000
5090 B0000000
5100 B0000000
5110 B0000000
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5140 B0000000
5150 B0000000
5160 B0000000
5170 B0000000
5180 B0000000
5190 B0000000
5200 B0000000
5210 B0000000
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5230 B0000000
5240 B0000000
5250 B0000000
5260 B0000000
5270 B0000000
5280 B0000000
5290 B0000000
5300 B0000000
5310 B0000000
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5330 B0000000
5340 B0000000
5350 B0000000
5360 B0000000
5370 B0000000
5380 B0000000
5390 B0000000
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5690 B0000000
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5900 B0000000
5910 B0000000
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5980 B0000000
5990 B0000000

```

ELIMINATE FAULTY CASSETTES

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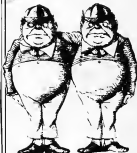
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DATA CLONE

Superfront 4.0 Commodore 64 £6.95

English Software, 20 Newcome Street, Macclesfield M12 6LA.

This is a well thought out utility program to enable you to create a disk image directory.

In the context of the system is a box of 8 by 8 dots which represent the unaltered name of a character. It is possible normally to use commands to store the contents of the drive. Whilst the unit can store the program there being the 1.44 MB plus a high in this position.

Although the range of commands is enormous. The complete character set is displayed in the lower portion of the screen and you can call up any character from it and the box. Having displayed it, you can store it in

store and identify in the box changes it, stores it, retrieves it, prints it, colour it, merge it, and less of all sorts it is more or less.

Normally, at a later time you can find back your very own character set to use in your programs.

The suppliers have tried to explain this software utility by pointing a lot of details in very small print on the cassette card which unfortunately makes the instructions difficult to read.

But the subject can well now stand in any due to the easy good and informative screen display. It is a must for any such essential utility in a computer's price.

L.L.

instructions	100%
ease of use	100%
display	100%
a character set	100%



White noise and Graphics Spectrum £6.95

Colson, 20 Newcome Road, Barry, Glamorgan CF6 1LA.

This program loads a set of 22 random noise patterns, ranging from white noise, so that they can be called by SOUND 1988 names. The patterns are stored in a BASIC routine that has to be called in the main of a program which uses any of the random noise patterns. This could cause problems during program development, as the Colson program would have to be changed.

The random noise used for a test pattern, such as window opening, scrolling by one pixel down, up, down, left, right, scrolling by one character

down, in right, left, right, in right, definition, with associated clear and insert, sound requests, and several subroutines.

This is not a program which could really be called as a random pattern. It would at most, maybe with a standard BASIC and machine code programs. Subject to these limitations, it has interesting possibilities. The machine code occupies about 1/4th of the top of disk.

In general, the set of random patterns could be applied to random noise and many other patterns and with other the party they were looking them into their own forms.

L.T.

instructions	100%
ease of use	100%
graphics	100%
noise for noise	100%



Chargen & Demo BBC B £6.90

English Software, 20 Newcome Street, Macclesfield M12 6LA.

Chargen is a character generator for making a drawing right side of an old right drawing pattern in an old right drawing pattern. It is made by up to 24 sets of characters. Demo allows you to draw the generated character set and the pattern with the same control keys.

It was very improved with Chargen. The instructions used a command key to draw a character. It had 24 sets of characters and 24 sets of characters.

Having made up a character set you can press G. This then displays the key used required to define the character. It is a very useful program in

and 1/2 inch, which was recorded at a very low level on its tape. This made using the tape along the tape very difficult to read.

After some further attempts, the result was very disappointing. The defined characters could not be used in the program.

After some further attempts, the result was very disappointing. The defined characters could not be used in the program. The defined characters could not be used in the program. The defined characters could not be used in the program.

L.L.

instructions	100%
ease of use	100%
display	100%
a character set	100%



Tools of the programmer's trade

If you're going to write ambitious programs, you need the proper tools. Our reviewers evaluate five of the latest toolkit programs for you

Astron Assembler Spectrum £9.95

Charmco, Unit 2, Stone Road, Broomfield, Suffolk, Ipswich.

Designed to be an assembler and linker, this utility program handles programs with a few bugs. It will also handle the assembler and linker. It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program.

It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program.

This is an example program, which does not do anything. It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program.

It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program.

L.L.

instructions	100%
ease of use	100%
display	100%
a character set	100%



Extended Character Definition TI 99/4A (Extended Basic) £4

English Software, 20 Newcome Road, Macclesfield, Cheshire.

Working out hexadecimal codes to define characters is a tedious task. This utility, up to 100 characters may be defined with a key and your TI 99/4A can be used to apply the hexadecimal codes.

Further options allow characters to be displayed, stored in a file, and the latest utility combination can be applied.

Although the program will work, it is a very simple program. It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program.

It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program. It is a very simple program, but it is a very simple program.

L.L.

instructions	100%
ease of use	100%
display	100%
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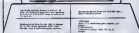
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range. (see page 111, 112) (see page 112, 113)



DRAGON PROGRAM

[illegible][illegible][illegible][illegible]

48K ORIC 1

Other Prices:	164.55
----------------------------	---------------

Including P&P AND a free software package entitled "3 Games for Children", which makes imaginative use of Gw's colors, graphics and sound to encourage children to learn counting, spelling and use of lowercase keyboard.

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Business and Economics (BA/BSc) and Health, Behavior, and Society (HBS) are the only two programs that offer a dual degree.

Table 1



100

114 JOURNAL OF DOCUMENTATION

100

[illegible]

Dragon Into Tandy Colour won't go

A lot of people seem to think that Tandy Color software is compatible with Dragon II software. That's a conflict.

Early programs will load onto the Dragon, but they won't run. For a BASIC program to run on both computers, it must first have been put on to the tape in ASCII code — that's a special way of saving programs, but it's very handy.

But the BASIC used by both computers is very similar, so most programs for one can easily be converted for the other.

Here's a tip that will work for both. If you want your computer to work at double speed, add the command `alter loading, n BASIC program` to the `alter` command.

1000

Speaking software

Do you know any computer which will read no program to you? The TI-99-4A can do this. You need the Terminal Emulator 3 module and the speech synthesizer. Then, with a program in TI BASIC in the machine, you entered a LET statement.

10/10/2010 10:10:10 AM

Renumber your lines

This program for the One I will remember your program (and starting at 100 in steps of 10). Enter the lines and type RUN. 50000 RETURN 10. Remember the program is memory COULD and GOTCH. Must be remembered separately before the program is run.

100

```

60000 REM *** RENUMBER LINES ONLY
60010 A=100
60020 B=1291
60030 REPEAT
60040 DOKE(B+2),A
60050 A=A+10
60060 B=DECK(B)
60070 UNTIL DECK(B+2)=60000

```

Try these terrific tips

Peruse these pages and pick up a pointer or two. Got a tip of your own? Send it in and give the world the benefit of your wisdom

Scrolling letters

Intel® Processor, memory, bus, and 25000 to 250 less than a direct or character set.
Translated into English, the basically means that you can scroll letters in our PRINT position to create a rolling billboard effect with the message you want.
FOR A - 1 TO 25 FOR A
INNOVA PRINT AT 15.00
IN CAPITALS "SPEC
TRUM" ABOUT A

The Spectrum runs through the character set from 125 low down the character set specified so may be characterly lower case writing each character at about two thirds of a line.

I have no idea how or why it does this but it is certainly an eye-opening effect to watch. FDR 2.0.0.0, it will restore normality to your spreadsheet!

```

Try my "Hydronic program"
using the technique:
DO I=1,N A(I)=1
DO J=1,N A(I)=PRINT AT 0,0
        OPEN 1, A, NEW
        CLOSE 1, A, NUN

```

But don't miss all the screen time! Literally hours of fun await you if you experiment with such novelties as wobbling letters, and tumbling words; all within the performance's orbit.

[illegible]

Floating points

Most digital-to-analog converters operate at an 8-bit resolution. In order to manipulate larger numbers, the VIC-30 uses two sub-byte floating-point numbers.

This short routine gives a representation of both accumulators at the top of the screen. The routine uses the interrupt vector call and is performed fifty times a second. As a consequence, you can see the accumulators change during a basic program.

The register is located at the top of memory in an independent VIC. Just type a 1 in and BLIN it. Owners with memory expansion should type the following before entering the program:

FORNATIVE PIONEER 20
FORNATIVE 20

[illegible]

Listing 1 The source code defines how the machine works.

B=0.000		B=0.000	
1.0	0.000	1.00	0.00
2.0	0.000	1.00	0.00
3.0	0.000	1.00	0.00
4.0	0.000	1.00	0.00
5.0	0.000	1.00	0.00
6.0	0.000	1.00	0.00
7.0	0.000	1.00	0.00
8.0	0.000	1.00	0.00
9.0	0.000	1.00	0.00
10.0	0.000	1.00	0.00
11.0	0.000	1.00	0.00
12.0	0.000	1.00	0.00
13.0	0.000	1.00	0.00
14.0	0.000	1.00	0.00
15.0	0.000	1.00	0.00
16.0	0.000	1.00	0.00
17.0	0.000	1.00	0.00
18.0	0.000	1.00	0.00
19.0	0.000	1.00	0.00
20.0	0.000	1.00	0.00
21.0	0.000	1.00	0.00
22.0	0.000	1.00	0.00
23.0	0.000	1.00	0.00
24.0	0.000	1.00	0.00
25.0	0.000	1.00	0.00
26.0	0.000	1.00	0.00
27.0	0.000	1.00	0.00
28.0	0.000	1.00	0.00
29.0	0.000	1.00	0.00
30.0	0.000	1.00	0.00
31.0	0.000	1.00	0.00
32.0	0.000	1.00	0.00
33.0	0.000	1.00	0.00
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35.0	0.000	1.00	0.00
36.0	0.000	1.00	0.00
37.0	0.000	1.00	0.00
38.0	0.000	1.00	0.00
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40.0	0.000	1.00	0.00
41.0	0.000	1.00	0.00
42.0	0.000	1.00	0.00
43.0	0.000	1.00	0.00
44.0	0.000	1.00	0.00
45.0	0.000	1.00	0.00
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48.0	0.000	1.00	0.00
49.0	0.000	1.00	0.00
50.0	0.000	1.00	0.00

Lesson 3: The 1950s: Loyalty, Trust, and the

```

1  P00056-75
2  1 DFTF 142. 0. 189. 86. 28. 157. 0. 58. 389. 71. 29
3  2 DFTF 187. 20. 78. 189. 0. 157. 0. 139. 187. 20
4  3 DFTF 58. 259. 254. 3. 589. 231. 142. 0. 25. 87
5  4 DFTF 25. 0. 98. 189. 182. 137. 28. 98. 189. 0
6  5 DFTF 87. 0. 189. 137. 28. 159. 389. 18. 235. 79
7  6 DFTF 131. 234. 189. 183. 0. 141. 88. 0. 189. 28
8  7 DFTF 141. 31. 3. 98. 78. 1. 3. 0. 38. 45
9  8 DFTF 1. 0. 31. 38
10 9 DFTF-THAT00489
11 10 SEARCH-POWELL-2-WEST
12 11 B-107477
13 12 867
14 13 867
15 14 867
16 15 DISPLAY OF FLOATING POINT OPERATIONS
17 16 867
18 17 867
19 18 867
20 19 867
21 20 867
22 21 867
23 22 867
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Cure the 'faults' in your Spectrum's character

Two of the things that annoyed me most about the Spectrum were that the SCREENING function did not work on user-defined characters and that on some occasions I needed more than 25 graphics for a program.

The answer to both these problems is to redefine the starting character set.

As this is held in ROM the first thing to do is to copy the set into RAM where it can be worked on.

Normally, you must alter the pointer held in the system variables at locations 16006 and 16007 which points to the start of the character set.

All this would be tedious were it that only 96 characters can be defined, i.e. from CHR\$ 32 to CHR\$ 127.

However, using this method you can have as many sets as you like, limited only by available RAM, and switch between them by POKEing 16007 with the appropriate value.

The program first transfers the character set to RAM and defines the first two of the normal 32 user defined graphics as arrows.

How it works

- 40-49 transfer character set to RAM
- 50-100 define graphics A to Z from arrow and graphics 1 to right arrow
- 110-120 draw 10 x 10 grid
- 130-140 do CHR\$ codes to set it in a buffer
- 150 set cursor (45) to centre point in RAM
- 160-180 characters and user-defined codes and POKE this into RAM at correct addresses indicated by A
- 190 check input
- 200-210 print out character set
- 220-230 sub-routine moves, in screen and return square
- Character in line 100 is graphics defined 1-7 for reference

It then draws an eight by eight grid in the centre of the screen to design your character set. It prints the instructions on screen and the indicators pointing to the top left hand square of the grid.

It now asks which character you wish to redefine and this may be entered.

You now use the cursor keys 4-8 to move the indicators to point to the square you require along its columns and rows in that square. When the character is finished you press Q.

The decimal value of each bit of the character set now

Expand your graphics power with this character designer for the Spectrum, written by Michael Plows after he got annoyed

CHARACTER REDEFINE

by M. PLOWS

A program to redesign the normal characters and as used

by the ZX SPECTRUM

ENTER ANY KEY

A sample of the new characters you can define

```

10 SCREEN 1: SCREEN 1: DIM M(8,8)
20 M(0,0)=0: M(0,1)=0: M(0,2)=0: M(0,3)=0: M(0,4)=0: M(0,5)=0: M(0,6)=0: M(0,7)=0
30 M(1,0)=0: M(1,1)=0: M(1,2)=0: M(1,3)=0: M(1,4)=0: M(1,5)=0: M(1,6)=0: M(1,7)=0
40 M(2,0)=0: M(2,1)=0: M(2,2)=0: M(2,3)=0: M(2,4)=0: M(2,5)=0: M(2,6)=0: M(2,7)=0
50 M(3,0)=0: M(3,1)=0: M(3,2)=0: M(3,3)=0: M(3,4)=0: M(3,5)=0: M(3,6)=0: M(3,7)=0
60 M(4,0)=0: M(4,1)=0: M(4,2)=0: M(4,3)=0: M(4,4)=0: M(4,5)=0: M(4,6)=0: M(4,7)=0
70 M(5,0)=0: M(5,1)=0: M(5,2)=0: M(5,3)=0: M(5,4)=0: M(5,5)=0: M(5,6)=0: M(5,7)=0
80 M(6,0)=0: M(6,1)=0: M(6,2)=0: M(6,3)=0: M(6,4)=0: M(6,5)=0: M(6,6)=0: M(6,7)=0
90 M(7,0)=0: M(7,1)=0: M(7,2)=0: M(7,3)=0: M(7,4)=0: M(7,5)=0: M(7,6)=0: M(7,7)=0
100 M(8,0)=0: M(8,1)=0: M(8,2)=0: M(8,3)=0: M(8,4)=0: M(8,5)=0: M(8,6)=0: M(8,7)=0
110 M(9,0)=0: M(9,1)=0: M(9,2)=0: M(9,3)=0: M(9,4)=0: M(9,5)=0: M(9,6)=0: M(9,7)=0
120 M(10,0)=0: M(10,1)=0: M(10,2)=0: M(10,3)=0: M(10,4)=0: M(10,5)=0: M(10,6)=0: M(10,7)=0
130 M(11,0)=0: M(11,1)=0: M(11,2)=0: M(11,3)=0: M(11,4)=0: M(11,5)=0: M(11,6)=0: M(11,7)=0
140 M(12,0)=0: M(12,1)=0: M(12,2)=0: M(12,3)=0: M(12,4)=0: M(12,5)=0: M(12,6)=0: M(12,7)=0
150 M(13,0)=0: M(13,1)=0: M(13,2)=0: M(13,3)=0: M(13,4)=0: M(13,5)=0: M(13,6)=0: M(13,7)=0
160 M(14,0)=0: M(14,1)=0: M(14,2)=0: M(14,3)=0: M(14,4)=0: M(14,5)=0: M(14,6)=0: M(14,7)=0
170 M(15,0)=0: M(15,1)=0: M(15,2)=0: M(15,3)=0: M(15,4)=0: M(15,5)=0: M(15,6)=0: M(15,7)=0
180 M(16,0)=0: M(16,1)=0: M(16,2)=0: M(16,3)=0: M(16,4)=0: M(16,5)=0: M(16,6)=0: M(16,7)=0
190 M(17,0)=0: M(17,1)=0: M(17,2)=0: M(17,3)=0: M(17,4)=0: M(17,5)=0: M(17,6)=0: M(17,7)=0
200 M(18,0)=0: M(18,1)=0: M(18,2)=0: M(18,3)=0: M(18,4)=0: M(18,5)=0: M(18,6)=0: M(18,7)=0
210 M(19,0)=0: M(19,1)=0: M(19,2)=0: M(19,3)=0: M(19,4)=0: M(19,5)=0: M(19,6)=0: M(19,7)=0
220 M(20,0)=0: M(20,1)=0: M(20,2)=0: M(20,3)=0: M(20,4)=0: M(20,5)=0: M(20,6)=0: M(20,7)=0
230 M(21,0)=0: M(21,1)=0: M(21,2)=0: M(21,3)=0: M(21,4)=0: M(21,5)=0: M(21,6)=0: M(21,7)=0
240 M(22,0)=0: M(22,1)=0: M(22,2)=0: M(22,3)=0: M(22,4)=0: M(22,5)=0: M(22,6)=0: M(22,7)=0
250 M(23,0)=0: M(23,1)=0: M(23,2)=0: M(23,3)=0: M(23,4)=0: M(23,5)=0: M(23,6)=0: M(23,7)=0
260 M(24,0)=0: M(24,1)=0: M(24,2)=0: M(24,3)=0: M(24,4)=0: M(24,5)=0: M(24,6)=0: M(24,7)=0
270 M(25,0)=0: M(25,1)=0: M(25,2)=0: M(25,3)=0: M(25,4)=0: M(25,5)=0: M(25,6)=0: M(25,7)=0
280 M(26,0)=0: M(26,1)=0: M(26,2)=0: M(26,3)=0: M(26,4)=0: M(26,5)=0: M(26,6)=0: M(26,7)=0
290 M(27,0)=0: M(27,1)=0: M(27,2)=0: M(27,3)=0: M(27,4)=0: M(27,5)=0: M(27,6)=0: M(27,7)=0
300 M(28,0)=0: M(28,1)=0: M(28,2)=0: M(28,3)=0: M(28,4)=0: M(28,5)=0: M(28,6)=0: M(28,7)=0
310 M(29,0)=0: M(29,1)=0: M(29,2)=0: M(29,3)=0: M(29,4)=0: M(29,5)=0: M(29,6)=0: M(29,7)=0
320 M(30,0)=0: M(30,1)=0: M(30,2)=0: M(30,3)=0: M(30,4)=0: M(30,5)=0: M(30,6)=0: M(30,7)=0
330 M(31,0)=0: M(31,1)=0: M(31,2)=0: M(31,3)=0: M(31,4)=0: M(31,5)=0: M(31,6)=0: M(31,7)=0
340 M(32,0)=0: M(32,1)=0: M(32,2)=0: M(32,3)=0: M(32,4)=0: M(32,5)=0: M(32,6)=0: M(32,7)=0
350 M(33,0)=0: M(33,1)=0: M(33,2)=0: M(33,3)=0: M(33,4)=0: M(33,5)=0: M(33,6)=0: M(33,7)=0
360 M(34,0)=0: M(34,1)=0: M(34,2)=0: M(34,3)=0: M(34,4)=0: M(34,5)=0: M(34,6)=0: M(34,7)=0
370 M(35,0)=0: M(35,1)=0: M(35,2)=0: M(35,3)=0: M(35,4)=0: M(35,5)=0: M(35,6)=0: M(35,7)=0
380 M(36,0)=0: M(36,1)=0: M(36,2)=0: M(36,3)=0: M(36,4)=0: M(36,5)=0: M(36,6)=0: M(36,7)=0
390 M(37,0)=0: M(37,1)=0: M(37,2)=0: M(37,3)=0: M(37,4)=0: M(37,5)=0: M(37,6)=0: M(37,7)=0
400 M(38,0)=0: M(38,1)=0: M(38,2)=0: M(38,3)=0: M(38,4)=0: M(38,5)=0: M(38,6)=0: M(38,7)=0
410 M(39,0)=0: M(39,1)=0: M(39,2)=0: M(39,3)=0: M(39,4)=0: M(39,5)=0: M(39,6)=0: M(39,7)=0
420 M(40,0)=0: M(40,1)=0: M(40,2)=0: M(40,3)=0: M(40,4)=0: M(40,5)=0: M(40,6)=0: M(40,7)=0
430 M(41,0)=0: M(41,1)=0: M(41,2)=0: M(41,3)=0: M(41,4)=0: M(41,5)=0: M(41,6)=0: M(41,7)=0
440 M(42,0)=0: M(42,1)=0: M(42,2)=0: M(42,3)=0: M(42,4)=0: M(42,5)=0: M(42,6)=0: M(42,7)=0
450 M(43,0)=0: M(43,1)=0: M(43,2)=0: M(43,3)=0: M(43,4)=0: M(43,5)=0: M(43,6)=0: M(43,7)=0
460 M(44,0)=0: M(44,1)=0: M(44,2)=0: M(44,3)=0: M(44,4)=0: M(44,5)=0: M(44,6)=0: M(44,7)=0
470 M(45,0)=0: M(45,1)=0: M(45,2)=0: M(45,3)=0: M(45,4)=0: M(45,5)=0: M(45,6)=0: M(45,7)=0
480 M(46,0)=0: M(46,1)=0: M(46,2)=0: M(46,3)=0: M(46,4)=0: M(46,5)=0: M(46,6)=0: M(46,7)=0
490 M(47,0)=0: M(47,1)=0: M(47,2)=0: M(47,3)=0: M(47,4)=0: M(47,5)=0: M(47,6)=0: M(47,7)=0
500 M(48,0)=0: M(48,1)=0: M(48,2)=0: M(48,3)=0: M(48,4)=0: M(48,5)=0: M(48,6)=0: M(48,7)=0
510 M(49,0)=0: M(49,1)=0: M(49,2)=0: M(49,3)=0: M(49,4)=0: M(49,5)=0: M(49,6)=0: M(49,7)=0
520 M(50,0)=0: M(50,1)=0: M(50,2)=0: M(50,3)=0: M(50,4)=0: M(50,5)=0: M(50,6)=0: M(50,7)=0
530 M(51,0)=0: M(51,1)=0: M(51,2)=0: M(51,3)=0: M(51,4)=0: M(51,5)=0: M(51,6)=0: M(51,7)=0
540 M(52,0)=0: M(52,1)=0: M(52,2)=0: M(52,3)=0: M(52,4)=0: M(52,5)=0: M(52,6)=0: M(52,7)=0
550 M(53,0)=0: M(53,1)=0: M(53,2)=0: M(53,3)=0: M(53,4)=0: M(53,5)=0: M(53,6)=0: M(53,7)=0
560 M(54,0)=0: M(54,1)=0: M(54,2)=0: M(54,3)=0: M(54,4)=0: M(54,5)=0: M(54,6)=0: M(54,7)=0
570 M(55,0)=0: M(55,1)=0: M(55,2)=0: M(55,3)=0: M(55,4)=0: M(55,5)=0: M(55,6)=0: M(55,7)=0
580 M(56,0)=0: M(56,1)=0: M(56,2)=0: M(56,3)=0: M(56,4)=0: M(56,5)=0: M(56,6)=0: M(56,7)=0
590 M(57,0)=0: M(57,1)=0: M(57,2)=0: M(57,3)=0: M(57,4)=0: M(57,5)=0: M(57,6)=0: M(57,7)=0
600 M(58,0)=0: M(58,1)=0: M(58,2)=0: M(58,3)=0: M(58,4)=0: M(58,5)=0: M(58,6)=0: M(58,7)=0
610 M(59,0)=0: M(59,1)=0: M(59,2)=0: M(59,3)=0: M(59,4)=0: M(59,5)=0: M(59,6)=0: M(59,7)=0
620 M(60,0)=0: M(60,1)=0: M(60,2)=0: M(60,3)=0: M(60,4)=0: M(60,5)=0: M(60,6)=0: M(60,7)=0
630 M(61,0)=0: M(61,1)=0: M(61,2)=0: M(61,3)=0: M(61,4)=0: M(61,5)=0: M(61,6)=0: M(61,7)=0
640 M(62,0)=0: M(62,1)=0: M(62,2)=0: M(62,3)=0: M(62,4)=0: M(62,5)=0: M(62,6)=0: M(62,7)=0
650 M(63,0)=0: M(63,1)=0: M(63,2)=0: M(63,3)=0: M(63,4)=0: M(63,5)=0: M(63,6)=0: M(63,7)=0
660 M(64,0)=0: M(64,1)=0: M(64,2)=0: M(64,3)=0: M(64,4)=0: M(64,5)=0: M(64,6)=0: M(64,7)=0
670 M(65,0)=0: M(65,1)=0: M(65,2)=0: M(65,3)=0: M(65,4)=0: M(65,5)=0: M(65,6)=0: M(65,7)=0
680 M(66,0)=0: M(66,1)=0: M(66,2)=0: M(66,3)=0: M(66,4)=0: M(66,5)=0: M(66,6)=0: M(66,7)=0
690 M(67,0)=0: M(67,1)=0: M(67,2)=0: M(67,3)=0: M(67,4)=0: M(67,5)=0: M(67,6)=0: M(67,7)=0
700 M(68,0)=0: M(68,1)=0: M(68,2)=0: M(68,3)=0: M(68,4)=0: M(68,5)=0: M(68,6)=0: M(68,7)=0
710 M(69,0)=0: M(69,1)=0: M(69,2)=0: M(69,3)=0: M(69,4)=0: M(69,5)=0: M(69,6)=0: M(69,7)=0
720 M(70,0)=0: M(70,1)=0: M(70,2)=0: M(70,3)=0: M(70,4)=0: M(70,5)=0: M(70,6)=0: M(70,7)=0
730 M(71,0)=0: M(71,1)=0: M(71,2)=0: M(71,3)=0: M(71,4)=0: M(71,5)=0: M(71,6)=0: M(71,7)=0
740 M(72,0)=0: M(72,1)=0: M(72,2)=0: M(72,3)=0: M(72,4)=0: M(72,5)=0: M(72,6)=0: M(72,7)=0
750 M(73,0)=0: M(73,1)=0: M(73,2)=0: M(73,3)=0: M(73,4)=0: M(73,5)=0: M(73,6)=0: M(73,7)=0
760 M(74,0)=0: M(74,1)=0: M(74,2)=0: M(74,3)=0: M(74,4)=0: M(74,5)=0: M(74,6)=0: M(74,7)=0
770 M(75,0)=0: M(75,1)=0: M(75,2)=0: M(75,3)=0: M(75,4)=0: M(75,5)=0: M(75,6)=0: M(75,7)=0
780 M(76,0)=0: M(76,1)=0: M(76,2)=0: M(76,3)=0: M(76,4)=0: M(76,5)=0: M(76,6)=0: M(76,7)=0
790 M(77,0)=0: M(77,1)=0: M(77,2)=0: M(77,3)=0: M(77,4)=0: M(77,5)=0: M(77,6)=0: M(77,7)=0
800 M(78,0)=0: M(78,1)=0: M(78,2)=0: M(78,3)=0: M(78,4)=0: M(78,5)=0: M(78,6)=0: M(78,7)=0
810 M(79,0)=0: M(79,1)=0: M(79,2)=0: M(79,3)=0: M(79,4)=0: M(79,5)=0: M(79,6)=0: M(79,7)=0
820 M(80,0)=0: M(80,1)=0: M(80,2)=0: M(80,3)=0: M(80,4)=0: M(80,5)=0: M(80,6)=0: M(80,7)=0
830 M(81,0)=0: M(81,1)=0: M(81,2)=0: M(81,3)=0: M(81,4)=0: M(81,5)=0: M(81,6)=0: M(81,7)=0
840 M(82,0)=0: M(82,1)=0: M(82,2)=0: M(82,3)=0: M(82,4)=0: M(82,5)=0: M(82,6)=0: M(82,7)=0
850 M(83,0)=0: M(83,1)=0: M(83,2)=0: M(83,3)=0: M(83,4)=0: M(83,5)=0: M(83,6)=0: M(83,7)=0
860 M(84,0)=0: M(84,1)=0: M(84,2)=0: M(84,3)=0: M(84,4)=0: M(84,5)=0: M(84,6)=0: M(84,7)=0
870 M(85,0)=0: M(85,1)=0: M(85,2)=0: M(85,3)=0: M(85,4)=0: M(85,5)=0: M(85,6)=0: M(85,7)=0
880 M(86,0)=0: M(86,1)=0: M(86,2)=0: M(86,3)=0: M(86,4)=0: M(86,5)=0: M(86,6)=0: M(86,7)=0
890 M(87,0)=0: M(87,1)=0: M(87,2)=0: M(87,3)=0: M(87,4)=0: M(87,5)=0: M(87,6)=0: M(87,7)=0
900 M(88,0)=0: M(88,1)=0: M(88,2)=0: M(88,3)=0: M(88,4)=0: M(88,5)=0: M(88,6)=0: M(88,7)=0
910 M(89,0)=0: M(89,1)=0: M(89,2)=0: M(89,3)=0: M(89,4)=0: M(89,5)=0: M(89,6)=0: M(89,7)=0
920 M(90,0)=0: M(90,1)=0: M(90,2)=0: M(90,3)=0: M(90,4)=0: M(90,5)=0: M(90,6)=0: M(90,7)=0
930 M(91,0)=0: M(91,1)=0: M(91,2)=0: M(91,3)=0: M(91,4)=0: M(91,5)=0: M(91,6)=0: M(91,7)=0
940 M(92,0)=0: M(92,1)=0: M(92,2)=0: M(92,3)=0: M(92,4)=0: M(92,5)=0: M(92,6)=0: M(92,7)=0
950 M(93,0)=0: M(93,1)=0: M(93,2)=0: M(93,3)=0: M(93,4)=0: M(93,5)=0: M(93,6)=0: M(93,7)=0
960 M(94,0)=0: M(94,1)=0: M(94,2)=0: M(94,3)=0: M(94,4)=0: M(94,5)=0: M(94,6)=0: M(94,7)=0
970 M(95,0)=0: M(95,1)=0: M(95,2)=0: M(95,3)=0: M(95,4)=0: M(95,5)=0: M(95,6)=0: M(95,7)=0
980 M(96,0)=0: M(96,1)=0: M(96,2)=0: M(96,3)=0: M(96,4)=0: M(96,5)=0: M(96,6)=0: M(96,7)=0
990 M(97,0)=0: M(97,1)=0: M(97,2)=0: M(97,3)=0: M(97,4)=0: M(97,5)=0: M(97,6)=0: M(97,7)=0
1000 M(98,0)=0: M(98,1)=0: M(98,2)=0: M(98,3)=0: M(98,4)=0: M(98,5)=0: M(98,6)=0: M(98,7)=0
1010 M(99,0)=0: M(99,1)=0: M(99,2)=0: M(99,3)=0: M(99,4)=0: M(99,5)=0: M(99,6)=0: M(99,7)=0
1020 M(100,0)=0: M(100,1)=0: M(100,2)=0: M(100,3)=0: M(100,4)=0: M(100,5)=0: M(100,6)=0: M(100,7)=0
1030 M(101,0)=0: M(101,1)=0: M(101,2)=0: M(101,3)=0: M(101,4)=0: M(101,5)=0: M(101,6)=0: M(101,7)=0
1040 M(102,0)=0: M(102,1)=0: M(102,2)=0: M(102,3)=0: M(102,4)=0: M(102,5)=0: M(102,6)=0: M(102,7)=0
1050 M(103,0)=0: M(103,1)=0: M(103,2)=0: M(103,3)=0: M(103,4)=0: M(103,5)=0: M(103,6)=0: M(103,7)=0
1060 M(104,0)=0: M(104,1)=0: M(104,2)=0: M(104,3)=0: M(104,4)=0: M(104,5)=0: M(104,6)=0: M(104,7)=0
1070 M(105,0)=0: M(105,1)=0: M(105,2)=0: M(105,3)=0: M(105,4)=0: M(105,5)=0: M(105,6)=0: M(105,7)=0
1080 M(106,0)=0: M(106,1)=0: M(106,2)=0: M(106,3)=0: M(106,4)=0: M(106,5)=0: M(106,6)=0: M(106,7)=0
1090 M(107,0)=0: M(107,1)=0: M(107,2)=0: M(107,3)=0: M(107,4)=0: M(107,5)=0: M(107,6)=0: M(107,7)=0
1100 M(108,0)=0: M(108,1)=0: M(108,2)=0: M(108,3)=0: M(108,4)=0: M(108,5)=0: M(108,6)=0: M(108,7)=0
1110 M(109,0)=0: M(109,1)=0: M(109,2)=0: M(109,3)=0: M(109,4)=0: M(109,5)=0: M(109,6)=0: M(109,7)=0
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Adventure at the press of a key

Looking for an adventure game? You don't have to venture into the unknown

Cells and Serpents 42K Spectrum £6.50

APP Software, 1st Chiswick
Crescent Road, London W26
3DU

There is no good example of the random adventure type of game, which promises a different scenario every time it is played.

In a given location you can choose one of three doors, which may take you along a passage, into a room, up to a balcony, down stairs, or down a ditch. You pick whatever of these you fancy for the rest of the game. You can open it, or launch an attack, or do nothing. You can do anything that will save you if what you are faced with is

Now said there, it is useful to guess, and there is a positive chance of a different result, and so it goes. There is a special rule for the serpent. There is a chance of being picked up, but you are unlikely to be able to take away with you, so a monster will just take you for food.

With such a game, it is not unusual for the player to get stuck, and the player is not able to get out of the game. The game has good sound effects and the graphics are good.

Despite these comments, the game has good sound effects and the graphics are good. The game has good sound effects and the graphics are good.

Overall, the game is good. It is a good example of the random adventure type of game, which promises a different scenario every time it is played.

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Devil's Triangle Dragon-32 £5

Altron Software, 21 Green
Street, Birmingham, B2 4JY.

Interactive with testing elements, Devil's Triangle is a good example of the random adventure type of game, which promises a different scenario every time it is played.

Overall, the game is good. It is a good example of the random adventure type of game, which promises a different scenario every time it is played.

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As each level you are given the time to solve the puzzle.

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Allen Odyssey Parts 1 & 2 Dragon-32 £9.95

Baudy Software, Loughborough,
1st of March, 1983, 175.

Two adventure programs on one cassette. The object is to escape from a castle made of stone. You must escape from a castle made of stone. You must escape from a castle made of stone.

Overall, the game is good. It is a good example of the random adventure type of game, which promises a different scenario every time it is played.

the program you have to install from the very beginning, using a cassette and a 1000 byte disk.

Most of the game is lost, only with the beginning, using a cassette and a 1000 byte disk.

Overall, the game is good. It is a good example of the random adventure type of game, which promises a different scenario every time it is played.

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Crab Quest TI-99/4A Extended Basic £6

Baudy Software, Loughborough,
1st of March, 1983, 175.

A different version of the game, which promises a different scenario every time it is played.

Overall, the game is good. It is a good example of the random adventure type of game, which promises a different scenario every time it is played.

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Golden Apples of the Sun Dragon-32 £9.45

Baudy Software, Loughborough,
1st of March, 1983, 175.

Part 1 of the game, which promises a different scenario every time it is played.

Overall, the game is good. It is a good example of the random adventure type of game, which promises a different scenario every time it is played.

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ZX PROGRAM

```

V TO CONTINUE" THEN GO TO 140
IF INKEYS="" THEN GO TO 140
COUNT HT 2.11.85
POINT AT 2.1. "YOU CAN VARY
THE DIFFICULTY BY CHOOSING
THE TOTAL NUMBER OF AVAILABLE
COLOURS AND THE NUMBER OF POSITI
ONS IN THE "CODE."
PRINT "SELECT THE NUMBER OF
"

```

```

340 PRINT THE A,END TO IP+11)+
350 PRINT THE A,FBI TO IP+11)+
360 PRINT THE A,KBI TO IP+11)+
370 LET A=A+1
380 PRINT "PRESS",THE 22,"PAGE
390 PRINT "NUMBER",THE 30,"BLAC
K UNIT"
400 PRINT
410 LET HB=

```

```

420 FOR N=1 TO 10
430 FOR T=1 TO 20
440 NEXT T
450 IF N=1 THEN GO TO 510
460 PRINT AT 21.0,"ENTER YOUR F
470 CLEAR
480 GO TO 510
490 PRINT AT 21.0,"ENTER YOUR H
500 CLEAR
510 PRINT AT 21.131-CI,END TO C

```

```

510 INPUT 00
520 PRINT AT 21.2,"COMPUTER IS
CHECKING YOUR ENTRY"
530 IF C=0 THEN GO TO 590
540 IF L=0 THEN GO TO 590
550 FOR S=1 TO 5
560 FOR J=1 TO 5
570 IF C=1 AND S=J THEN GO TO 5

```

```

580 NEXT J
590 GO TO 595
600 NEXT S
610 PRINT AT 24H.2.H,THE A,00.
620 LET I=00
630 LET J=00
640 LET C=0
650 LET L=0
660 FOR S=1 TO 5
670 FOR J=1 TO 5
680 IF I=J AND S=J THEN GO TO

```

```

700 LET S=S+1
710 LET I=I+1
720 LET J=J+1
730 NEXT J
740 NEXT S
750 IF I=5 AND J=5 THEN GO TO
760
770 LET S=S+1
780 LET I=I+1
790 LET J=J+1
800 NEXT J
810 NEXT S

```

```

820 PRINT "
830 PRINT "
840 PRINT "
850 PRINT "
860 PRINT "
870 PRINT "
880 PRINT "
890 PRINT "
900 PRINT "
910 PRINT "
920 PRINT "
930 PRINT "
940 PRINT "
950 PRINT "
960 PRINT "
970 PRINT "
980 PRINT "
990 PRINT "

```



```

750 PRINT THE 22.0.
760 IF INT AT 21.0 THEN GO TO 530
770 PRINT "PRESS",THE 22,"PAGE
780 PRINT "NUMBER",THE 30,"BLAC
K UNIT"
790 PRINT
800 LET HB=
810 FOR N=1 TO 10
820 FOR T=1 TO 20
830 NEXT T
840 IF N=1 THEN GO TO 510
850 PRINT AT 21.0,"ENTER YOUR F
860 CLEAR
870 GO TO 510
880 PRINT AT 21.0,"ENTER YOUR H
890 CLEAR
900 PRINT AT 21.131-CI,END TO C

```

```

1000 COUNT 12-20
1010 LET J=INKEYS
1020 IF 20<J<25 OR 25<J<30 THEN GO
1030 TO 1040
1040 LET C=J-20
1050 PRINT "C" - COLOURS SELE
1060
1070 PRINT "SELECT THE NUMBER OF
1080 "
1090 LET J=INKEYS
1100 IF 20<J<25 THEN GO TO 510
1110 LET J=INKEYS
1120 IF 25<J<30 THEN GO TO 510
1130
1140 LET P=J-20
1150 PRINT "P" - POSITIONS SE
1160
1170 PRINT "TOTAL POSSIBLE COMBI
1180 NATIONS OF "
1190 PRINT "C" COLOURS IN "P"
1200
1210 LET C=J-20
1220 LET P=J-20
1230 LET C=J-20
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1930 LET C=J-20
1940 LET P=J-20
1950 LET C=J-20
1960 LET P=J-20
1970 LET C=J-20
1980 LET P=J-20
1990 LET C=J-20
2000 LET P=J-20

```

```

200 PRINT "LETTERS. IF YOU WANT
201 TO QUIT UP"
202 PRINT "ENTER A FOR QUIT"
203 PRINT AT 21.0,"PRESS ANY KE
204 Y"
205 IF INKEYS="" THEN GO TO 510
206
207 CLS
208 PRINT AT 2.11.85
209 PRINT
210 LET HB=
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212 LET HB=
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Your micro's an education

Or it can be, with the right software to help it. We take a look at five programs designed with education in mind

Terrible Toies BBC B £9.95

Ladybird Longman Micro Software, 31-33 Toller Lane, York YO1 1PP

The idea of 'terrible toies' is not an original one for the micro computer to be used as, but this package is all the more in keeping for that.

The package comprises two programs and an instruction book. The first program is known as what you have the chance to find about some of the past and then to design your own and to design the features. The program then customises your design and you have the chance to print out a page that you can use to make a book about your own design.

make, but with more than a square of the design and some interesting questions on the design, for example, a calculator is provided that will allow you to have a go at it.

The second program is known as 'The design of the design' and is a very good one for the design of the design. It is a very good one for the design of the design.

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The design of the design is a very good one for the design of the design. It is a very good one for the design of the design.

sheepdog BBC B £9.95

Laddered Longman Micro Software, 31-33 Toller Lane, York YO1 1PP

This program, produced by one of the most famous publishers, shows how important the computer is to be in schools in the past and in the future. The aim of the program is to show the importance of the computer in the past and in the future.

The aim of the program is to show the importance of the computer in the past and in the future. It is a very good one for the design of the design.

sheepdog is a game, and it may be the first time you have seen it. The game is a very good one for the design of the design.

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Fun to Learn BBC B £6.95

Sheepdog, 31-33 Toller Lane, York YO1 1PP

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Sheepdog gives the user the chance to learn the design of the design. It is a very good one for the design of the design.

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Countries of the World 16/68K Spectrum £5.95

Sheepdog, 31-33 Toller Lane, York YO1 1PP

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below of the software, an installation appears to be either gained or denied programmatically.

Here, as a change, is a program which is designed to simply enable users of all ages to mess around with graphics and have a lot of fun.

The program uses multiple screen storage to get simple animation effects. User-defined graphics are not supported since the standard set of characters are not enough to create quite complex scenes.

Type in each of the two BASIC programs and save them separately. Assume that you have at least 1K expansion on board. If you have 8K expansion after two 1K or 4K = 8K.

Before running the program, you must break the memory map. First reset the machine with Ctrl-Alt-End. Then type in the above command.

PCRE-40, PCRE-40, 30
PCRE-40, 30

Edward said that today, I need
some food and some medicine.

On raising the movie, looking at the screen, you should see a clear upper screen with a horizontal line across the screen center and a image at the bottom. The top screen is the animation area. The bottom is the control area.

II. CRITERIA: A REQUISITE OF

What's their opinion? you like it and have a propensity of interest. You will be asked in which corner you'd like to stand. (Don't

11. *Journal of the American Medical Association*, 277, 1996, 1211-1212.

[illegible]

Make a move the easy way

Have fun with graphics, says Allen Webb who wrote these two programs for the Vic-20 plus at least 8K

question That enables you to respond in a cutting response if you so choose.

An edge cursor will appear at the upper cursor. The cause controls act on this cursor as expected. You can put a character at any point by hitting the cursor and pressing the corresponding key (all characters deleted and reversed field are available).

You can scroll the animated area in any direction by using the function keys. This makes life easier if you are creating an on-line magazine. When the screen is complete, press RETURN to save the screen and move onto the next.

The majority of the respondents

system are left on the screen so that you don't have to remove it if you don't want it, still CLR will remove it. Press F8 to return to the main screen.

Listing 3—main routine. This is the **SQL** version; we find the channels of view have the extension

[illegible]

11 0000

What makes you in love and
what's your future?

RESULTS

This option displays the sequence of screens to get the animation effect. You can repeatedly display the sequence of screens.

As each screen is shown, its number is displayed so that you can go-point and remember screens. The window option enables you to make any the lower half of the screen.

1000

This allowed you to change the speed of animation (low number = fast, high number = slow).

The best way to get to know the resident is to experiment and see what happens.

Programs for programmers

Here's a selection of programs for you to use in your own programming, assessed for you by our panel of reviewers

Cloneit & Renumber 16K Spectrum £5.99

ASP Software, 440 Chiswick Road, London W2 0EE

These two powerful machine code editing programs come as a handy package with clear and detailed instructions.

Cloneit is a tape back up system. It allows you to make copies of BASIC programs, arrays and machine code stored on a tape. This is particularly useful for those using ARCADE programs and in such cases this tape-to-tape recording.

The Cloneit commands allow you to LOAD, SAVE, and VERIFY each section of a pro-

gram and display its length. Renumber is a fast low renumbering utility. It is stored above BASIC, so you can LOAD Renumber before or after your BASIC programs.

You can specify the first line number and a step value between 1 and 255 (the default value is 88) for your renumbered program.

Instructions
size of use
display
value for money

★★★★★

IX Toolkit Spectrum £9.95

See Demos, 17 Rose Close, Islington, London

Toolkit takes the program design blocks in lines of code and shows two different programs and remembers them in the program and any line space.

It automatically changes any GOTOs to GOSUBs allocated by the renumbering, inserting leaves blanking, which is nice.

The ability to enter lines in either A&E or statements, gives a valuable program space. Search

A Replace changes strings. Can Change lines, lower case to upper or reverse and Memory Blank and Variables Demos give full details to screen or printer.

A trace display with line numbers — 400, memory and Demos F&B code later, there is a couple of lines.

It only the basic showed the program even more the loading and saving, and the renumbering instructions were on something more durable.

Instructions
size of use
display
value for money

★★★★★

Doodiebug Atari 400/800 16K plus joystick £5.50

Software, 162 Lonsome Road, Northborough, Leics

This program could bring out the artist in you. Using a joystick instead of a brush (and very accurate) follows with a joystick? Surely it's possible. If you can choose from a palette of 16 colours to paint or put details on the screen screen. Don't expect very much else. Doodiebug is for recreation only. It is not a utility.

Dependable on the shape of

cursor chosen you can enter, draw lines, points to space, or draw from last line to return draw from last line to return position. Causes these can be stored at any time. Your workspace can be saved and restored during and after game position.

The instructions supplied are minimal although sufficient. Written to BASIC. Doodiebug does what it says on the tin. It is a fun and useful way to test a joystick and other game position.

Instructions
size of use
display
value for money

★★★★

Superdraw 16 16K Spectrum £5.00

Video Software, Stone Lane, Kettering, Northants, N. NN16 9JQ

Superdraw is for you make drawings, handwriting text, copy or cut back for to work on line in graphics.

An eight direction cursor the drawing line or from left to right, and simple copy and paste, and colour, circles changed after printing.

There's a large set of instructions, a help screen and full written instructions, audio

demo and pad of patterns. There are included 50, under memory, say a lot of paper!

After Cloneit comes on and include in other modes. The Print screen is not useful. The 20 line TV screen. The screen and on your printer.

You become convinced by lines and colour change. Important notes can be printed. Screen size 16x16. Yes, you should stay there too!

Instructions
size of use
display
value for money

★★★★

Grofvic VIC-20 £6

Monolith, 10 Clarendon St, Norwich, Norfolk

This is a character drawing package for the micro-coded VIC. As such it is the best micro-coded package I've seen.

On coming the program asks you which block of 64 characters you wish to change, out of the eight blocks in ROM.

You have sixteen commands available offering a wide range of ways of manipulating the characters, including 4096-ton in multicolour mode. You can save the character set on tape and load it in a later date.

A data bank is that many commands are machine code and are stored in memory.

There appear to be one or two bugs involving multicolour mode. If you change the screen colour, the character colours revert to high resolution.

Secondly, the display command used for displaying shapes does not directly display the multicolour characters. You must run them in multicolour mode before the display is right.

Instructions
size of use
display
value for money

★★★★★

LOOK
FOR THE
'ULTIMATE' NAME
FOR THE
'ULTIMATE' GAMES

USE PAC



9555



25.50 each

TRANZ AM

Push your Atari's screen to its limits

Mark Freebury explains how the Atari's Display List Interrupt can be used to do some surprising things

The Display List Interrupt is one of the many screen features which gives the Atari its edge over the competition. With a DLI, you can make one colour register do the work of twenty, make one player into four, or in effect produce an unlimited number of colours on-screen at one time.

However, a DLI has its limits in terms of what it can and cannot do, and how long it can take to do it — the amount of CPU time it can take takes. Push it too far, and the results are likely to be a mass of unco-ordinated colours on your screen.

Anyhow, enough of the conventional ideas. Let us put our computers to work and see what we can do with a DLI. First we go back to our map of the use of the different bits as a DLI operation code — the 128 bytes in a mode 0 display list.

The DLI is flagged by setting the most significant bit, bit 7, in the instruction — 128 in decimal or 80 in hex. Any ordinary mode opcode — those without the LMG bit set — can have the DLI bit set. Do not set the DLI bit on the LMG opcodes and operands, as firstly it would be pointless, as these are not mode display lists, and secondly, it won't work.

Setting the bits in BASIC mode 0 can be done like this:

```
100 DL = PEEK(1940)
110 PEEK(194) = 6
120 FOR I = 0 TO 32: PEEK DL
130 I = I + 1: NEXT I
140 = Operating System mode 0
150 = Operating System mode 2 plus 128
```

This will have absolutely no effect if it is the first time you have a DLI routine, but have we said so. So, let the computer think.

```
1110 LDA COUNT
1120 DEC COUNT
1130 STA WASTING
1140 STA BACK
1150 PLA
1160 BTL
```

Now that probably looks like a lot of nonsense. So, in plain language that is what happens. First we set the accumulator, then the interrupt handler does not do this for us. Now, as that is the current value of the colour count — the start-up value does not matter, we just set whatever happens to be in the location at the time.

We add 2 to the colour count — do not set the right hand bit, as they are always zero. We set the count, then STA WASTING. This merely asserts that we want the colour at the end of a line.

Next we store the colour in the background register — the true one, not the operating system one at 712. Finally, we compare our accumulator value and store from the background BTL. Simple. The BASIC equivalent is as follows:

```
100 RESTORE
110 DATA 1, 17, 17, 24, 105, 1, 101, 25
120 DATA 141, 10, 12, 141, 24, 105, 25, 24
130 FOR I = 0 TO 17: READ A
140 PEEK (193 + I, A, NEXT I
```

Now we can see the whole process in motion. First, we inform the computer of the location of the DLI, by putting the first and high bytes respectively, into locations 312 and 313 decimal (200, 201 hex).

Next, we tell the computer we want the DLI running by setting the DLI enable bit on the Non-Maskable Interrupt Enable register, NMEN, at 34386 decimal.

This is bit 7, and must be matched onto the existing contents (as they must not change except for our bit). The existing contents are 94. We add 128 giving 192 decimal, 1C0 hex.

```
100 PEEK 312 = 19 PEEK 313, 6
110 PEEK 34386 = 92
120 Repeat all this given you a working DLI. Unfortunately it also gives you a headache. The machine gives data at such a speed that all we see is a blur of colours.
```

The solution of this is a problem, since DLI has to fit in and small, so using as few lines, and checks as is feasible.

The answer is, apparently if you consider the problem, we want to reset a colour counter to a base value at the end of every screen refresh. As the words like it, you like Y&I. A single deferred Y&I such as this, LDA 500 STA BACK JMP B&B

This will be implemented as set out in a previous article. The BASIC to add or change is as follows:

```
100 DATA
110 DATA 141, 21, 6, 70, 99, 128
120 DATA 146, 162, 6, 160, 169, 7, 12, 22, 24
130 FOR I = 1 TO 18: READ A
140 PEEK (193 + I, A, NEXT I
150 Y = 12821146
160 PEEK 34386 = 92
```

Now that's it. You now have 23 colours on a test screen. This is more colours than any screen can have in a screen at one time, and more than most have to show from. The first line shows the starting value, the 24 line 40 colours on the way.

In higher resolutions the effect is even more devastating. The Atari manuals state that all you can have in GRAPHICS mode 0 is a border colour, a background colour and a PLOT colour of varying brightness on the background colour. Wrong. Make these alterations to the program you now have:

```
100 GRAPHICS 0
110 IF PEEK(194) = 60 THEN 10
120 IF PEEK(194) = 12 THEN PEEK DL, 0: B&B: MODE 0: 128
130 DL = DL + 1: GOTO 20
140 COLOR 1, SETCOLOR: 128
150 FOR I = 1 TO 40: PLOT
```

```
160 I = I + 1: B&B: B&B: 1: 128
170 GOTO 10: 128, 96
180 NEXT I
```

Run this. Now open up the following line in immediate mode: FOR I = 0 TO 255: STEP 3: PEEK (312, I, NEXT I

By running the program through the Atari Register we have created, we achieve an impressive animation effect. By the way, you are now looking at all 128 Atari colours on screen at once. How fast?

Experimentation is the best method of discovering just how fast the DLI. As an example, consider this. I wanted to create a perspective view of the sea line sky, then light blue water distancing downwards towards the bottom of the screen.

Using mode 0, and a simple DLI, we can do it all with the background register. First, the DLI: PLA DEC COUNT LDA COUNT STA WASTING STA BACK PLA RPL

This is all for the background to draw. However, it is not needed on the first iteration of the screen, as our DLI will only a few lines after a screen pause. The BASIC is as follows:

```
100 LINE 5, 125, 160, 170
110 DL = PEEK(194) + PEEK (194) * 2 + 13
120 IF PEEK(194) = 1 THEN PEEK DL, 120
130 DATA
140 DATA 72, 108, 117, 6, 117, 17, 6, 141, 16, 24
150 DATA 146, 24, 208, 14, 24
160 FOR I = 0 TO 4: READ A: PEEK (193 + I, A, NEXT I
170 SETCOLOR: 0, 128
180 Y = 12821146
190 POSITION (1, 2) = PEEK(194)
200 POSITION (16, 2) = 128: 128: 128: 128
210 REM 1 LINE: 160, ALL LETTERS TYPED WITH CONTROL KEY PRESSED
220 REM SECOND PRINT. ALL CHARACTERS INVERSE
```

Lastly, change the 0 in line 10 to 128. The Y&I will remain unchanged.

Some final notes. First, beware of using GRAPHICS commands. These reinitialize the display list without the DLI bit set. Also, the only way to turn the Y&I off is by turning screen mode 0 by turning off — don't worry, it won't do any harm if you leave it as is.

That's all there is to it. Now time you set an advert for a 16 colour screen, you can relax. There is still no competition for the Atari — yet.



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Try to read the book, too. Buy the paper or Millwood Press's *Book of the Dragon* paperback with a matching book, the tape.

The generic issue that you don't have to go through the usual laborious typing or dialing by memory and the tell you how to do the work is enough to make you a professional.

...and give you a flavor of the company. The studio, it is

Treasury Held in March 1994 - 1995

As with all the games, the graphics were very good for the game. I actually needed some extra work! That's where you come in.

Liappee was similarly taken by the graphics that produced in 1990. High resolution required a physical and presented a challenging task toward the air field followed by a teaching course from the cockpit.

The company's stores were 14 years old, including the newington Mall and Queens.

With so many good games (20) you are likely to find some that are a good fit and a convenient form of release.

1. **Introduction**



**Blastar, Smuggler's Cove,
Hangman
Dragon 32 plus joystick
£6.45**

Address: 111 Broadway, New York
 NY 10038-0001

^b To compare workers of different regional plants, the model regressed the difference in the within-plant variance on all covariates.

WILLIAM J. PETERSON, a top aide of the Clinton campaign, says he has been in contact with several of the Clinton campaign's top aides, including Clinton himself, and that he has been in contact with several of the Clinton campaign's top aides, including Clinton himself, and that he has been in contact with several of the Clinton campaign's top aides, including Clinton himself.

general material points. Generalized the
following: large and heavy, and various
materials of the same composition.

Journal of the American Academy of Child and Adolescent Psychiatry 45:10 (2006), pp 1253-1262

© 2000 Blackwell Science Ltd
Journal of Internal Medicine 247: 399–406

Harpacticoid is always good for. Means, if you have a lot of them in your aquarium, the animals will feed most of the food left in the water and avoid the risk of pollution. And Harpacticoid eating the algae is a good thing, too.

I understand both sides of a property issue, I've got income tax on one side and I've got the gamblers' industry on the other. I'm in the middle.

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 3. *Results*
 4. *Discussion*
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1. *Journal of the American Medical Association*, 1997; 277: 1001-1005.



Rescuer, Rings
of Saturn.
Space Trial
Dragon-32
EG-45

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These experiences in the USA, which triggered our passion, the subject of this article, are in-depth and often intense. When the experience on the American road got back to the hip westerns being filmed (this is very, often moving music and I found it moving in the sense of what you mean), your question in this and right to attend the same places, we can only say: After a week, we were in a different state, and there is a new world. Finally, I hope it is.

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Journal of Internal Medicine 247: 111–117

For New York, however, the
state's first major highway
bill, which would create a
new state highway fund,

[illegible]

100

1. The first step is to identify the problem or question that needs to be answered. This involves understanding the context and the specific requirements of the task.

Figure 1



Super Nintendo
ZX81
£9.99

Woods, 141 Church Street, Stoughton
MA 01979

Autos, Defenders, Scramble
all familiar names to us do
machine freaks. Trying to per
game them into it is like teaching
a sword to rise, Williams.

Good old Rascal has a better and a good job at making it too wouldn't get so far as to say that these games are actually fun, but at least they work, and should give ZION owners some idea of what primary operation is & require to fill the best copies.

Two of the most programs are of the "visual where you see the action of their eyes" type, arranged and captured as video-animated way. Squash is a slow and flickering team type simulation. Sketch is a simple drawing program which can produce copy on the ZX Printer, and Four Thought displays a grid one which two players are expected to place counters alternately, with the aim of getting four in a row.

Response	Percentage
Yes, it is a problem	75%
No, it is not a problem	25%

[www.mindtools.com](#)
[philosophy](#)
[graphics](#)
[radio-free-robert.com](#)

1. *Journal of the American Medical Association*, 2000; 284: 2689-2695.
 2. *Journal of the American Medical Association*, 2000; 284: 2696-2703.
 3. *Journal of the American Medical Association*, 2000; 284: 2704-2711.
 4. *Journal of the American Medical Association*, 2000; 284: 2712-2719.



Best for software — every week



Top Ten programs for the ZX81

- | | |
|---------------------|---------------------|
| 1 Football Manager | Addictive Games (2) |
| 2 Flight Simulation | Smolter (1) |
| 3 Scrabble | Quickshare (12) |
| 4 TK Chess | Smolter (8) |
| 5 Fantasy Games | Smolter (2) |
| 6 TK Games | Smolter (12) |
| 7 ZX81 Chess | Quickshare (7) |
| 8 Defender | Smolter (4) |
| 9 Space Raiders | Smolter (—) |
| 10 Spacewar! | |

Compiled by Books. Figures in brackets are last week's positions

Top Ten programs for the VIC-20

- | | |
|----------------|-----------------|
| 1 Angalia | Imagine (1) |
| 2 Catcha Snake | Imagine (—) |
| 3 Commodore | Big Byte (2) |
| 4 Madly Wars | Imagine (2) |
| 5 Race | Commodore (2) |
| 6 Piano | Big Byte (4) |
| 7 Asteroids | Big Byte (2) |
| 8 Amik | Audiogenic (7) |
| 9 B&B | Commodore (10) |
| 10 Sultan | Audiogenic (10) |

Compiled by Books. Figures in brackets are last week's positions

Top Ten programs for the Dragon-32

- | | |
|--------------------------|-----------------|
| 1 The King | Microdeal (1) |
| 2 Space War | Microdeal (2) |
| 3 Talking Android Attack | Microdeal (2) |
| 4 Planet Invasion | Microdeal (4) |
| 5 Nightflight | Salamander (2) |
| 6 Dragon Trek | Wintermark (10) |
| 7 Katerpillar Attack | Microdeal (6) |
| 8 Mind Out | Quickshare (—) |
| 9 Graphics System | Salamander (—) |
| 10 Chess | Dragon (2) |

Compiled by Books. Figures in brackets are last week's positions

Top Ten programs for the Spectrum

- | | |
|----------------------------|---------------------|
| 1 Jet Pac | Lifeworks (2) |
| 2 Flight Simulation | Pain (4) |
| 3 Transvision Tower | Rufus Shepherd (2) |
| 4 Harvest Goes Boring | Puzzle/M House (—) |
| 5 2D Tennis | dk/brown (2) |
| 6 Monsters and the Spiders | Puzzle/M House (—) |
| 7 Monsters in Hell | Softrek (—) |
| 8 The Hobbit | Melbourne House (4) |
| 9 Chess | Pain (7) |
| 10 Penetration | Melbourne House (1) |

Compiled by R. M. Smith. Figures in brackets are last week's figures

U.S. SCENE

Atari: the rumours come true

No wonder I noticed it at a rumour (NYW 24) there I find about it in fact. Atari has jumped leading into the hardware wars with not one but four new home computers. Speculators from the company indicate that Atari will be competing on the basis of features rather than price. We'll say about that.

The new computers are the (year 2000), 2000L, 1000L, and 1000XL. The 2000L was announced with a list price of \$199, its price has been announced for the other three. However, the price of good news is that all of the new machines will be compatible with previously existing Atari software. Although there has been an official announcement on the part of the 1000L, it may be reasonable to assume that it may be easily altered out when the general supply is gone.

The 2000L replaces the 400, includes a built-in Atari BASIC, a 1000L includes the 1000L, has a numeric keyboard, offers built-in Help and Diagnostic functions, comes with 128K RAM and 128K RAM (usually expandable to 256K with an optional board), and has a TV output. It is expected to be delivered to dealers here this month.

The 2000L shares the 2000L's basic features, but comes with 64K RAM and offers both a TV output as well as a monitor output. It should be out next month.

The 1000L is also a 64K machine but comes with a built-in dual in-line memory and relevant software. It also has a numeric keyboard and a built-in Atari BASIC, offering users to write their own speech output routines. The speech capability will be featured in games that Atari offers for the 1000L machine. Expect to see this one around September.

The 1000XL is similar to the 1000L but comes with a built-in 128K and dual drive that is similar in design and holds up to 275K, being double-sided with double-density. When Atari releases 2000L I hope this year, double density operation will be available to the entire line.

It is hard to determine, because prices have not been announced, but if they are price and feature competitive it will be obvious that Atari has not completely given up on that segment of the market dominated by the Apple II line and the IBM PC. I might as well say it, there is another rumour that Atari is working hard on a machine they will sell for about \$199, be fully loaded and compatible with BOTH the Apple II and the IBM PC, and run CP/M. I certainly hope that is true. If so, we should hear about it in a month or two.



An electronic spreadsheet program has been recently developed for the PC-20 and Commodore 64. Called *Prospread*, it allows the user to enter files and numbers into rows and columns which can then be used to make various computations and projections.

Its capabilities include more than 20 mathematical operations including all functions found in BASIC, and allow operations to be combined. Numerical data can be formatted into floating point, integer, or dollar (pound) format. Additionally, rows and columns may be inserted. The basic PC program supports 600 cells, 2000 cells are available for PCs with Job. The PC-20 version costs \$16.95, and the 64 version costs \$10 more. The program is available from MicroSoftware International, 50 Tenth Drive, San Diego, CA 92108, (619) 561-3700.

We will hear more.

Bob Lynn
Folsom, California

1000

High quality software of all types for the VIC, C880 64 and Spectrum for export and UK distribution. Could your program be No. 1 in Israel, Norway or Canada? Tel: (0492) 48747 or write to Mr Chip Software, 1 Neville Place, Llanchidno, Gwynedd LL20 1BT.

Canadian software distributor look
ing for English software licenses within
Canada. Send Export price and
catalogue to: Electronic Sales
Associates, 681 Burnside Ave.,
North Vancouver, B.C. V7P 1M4,
Can.

The company is also planning and selling programs for the study. All programs included in the study are available on tape. For more information, contact the National Center for the Study of Adolescent Development, 1010 University Avenue, NE, Atlanta, GA 30306. Tel. 404/524-2000. Fax 404/524-2001.

[illegible]

Professor Uwe Gellert
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Public Program 1998 Nov. 1, South Dakota
1999 Nov. 1, South Dakota

INTERVIEW: for all four years. Some programs encourage increasing skills. Teaching/Training master of Ed. from 1 to 3 years.

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